

AES-3 Cable Distance Solutions

AES-3 transmission distance and cable length

The Problem

The AES-3 format is intended to use balanced twisted pair cable of the correct type, and at 48Khz sample rate will be reliable at cable lengths up to 100 metres.

Factors that affect the distances possible depend on the Transmitter output voltage, Receiver sensitivity, correct impedance termination of cables and common-mode rejection of the transmitter and receiver.

The transmitter, depending on the devices used, will produce signals in the range 2volts p-p to 7volts p-p, with 4volts p-p being the most common. The receiver sensitivity may also vary, with a minimum level of 200mV being most common.

When the signal travels down the cable, the signal will attenuate, with the higher frequencies attenuating more than the lower. The edges of the signal will therefore soften, and the jitter of the signal will increase. These two factors limit the distance the signal will travel. As higher frequencies attenuate more than low frequencies, higher sample rate signals will travel less distance, on a pro-rata basis.

For longer cables, induced interference and crosstalk from other circuits will also be a problem. Receivers should therefore be correctly terminated and have common mode rejection of at least 30dB.

Multiple receivers may be connected together provided only the furthest receiver is terminated, and cables kept short to minimize reflections.

The Solution

Equalization may be included in the Receiver to restore the higher frequencies, and extend the range to around 200metres. To get longer distances however, either more sensitive receivers or Fibre-optical paths must be used. BCD have a number of solutions to this problem.

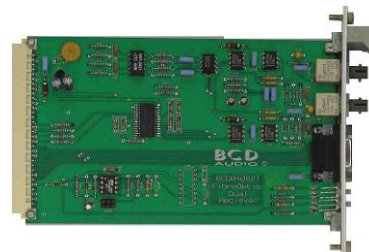


This **LAB-1** black box uses a sensitive Linear receiver with equalization, and enables signals from 500 metres to be recovered.

This **FAB-1** black box uses simple equalization so that cables up to 200 metres



can connect to the box, and converts the signal to ST-fibre, enabling distances up to 2 kilometres to be used.



BCD also have fibre solutions in Eurocard, 1U and module form.

